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## Notes on Some Mexican Lizards of the Genus *Holbrookia*, with the Description of a New Species

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**ABSTRACT:** The collections studied were secured in Mexico during the summers of 1932 and 1934, by Edward H. Taylor, David H. Dunkle and Hobart M. Smith. The species discussed are *Holbrookia bunker*i (new species), *H. dickersonae*, *H. maculata approximans*, *H. texana*, *H. elegans elegans* and *H. elegans thermophila*.

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THE following notes and descriptions are based upon the specimens of the genus *Holbrookia* in three collections of reptiles and amphibians from Mexico—one secured during the summer of 1932 by Dr. Edward H. Taylor and myself, another during the summer of 1934, by Mr. David H. Dunkle and myself, and the other secured in 1934 by Doctor Taylor. Specimens in the collections are designated by EHT and HMS, DHD and HMS and EHT, respectively.

I wish here to express my appreciation for the aid received, in the collection and study of this material, from Dr. Edward H. Taylor, Mr. David H. Dunkle, Mr. C. D. Bunker and Dr. H. H. Lane. I am further indebted to Mr. J. C. Bay of John Crerar Library for his kindness in loaning necessary reference books. The study has been aided by a grant received from the University of Kansas graduate research fund.

*Holbrookia bunker*i, sp. nov.

(Plate XXVIII, fig. 3)

*Holotype.* Female, DHD and HMS No. 80, collected 15 miles south of Juárez, Chihuahua, Mexico, on June 19, 1934, by David H. Dunkle and Hobart M. Smith.

*Diagnosis.* A *Holbrookia* of moderate size; tail longer than body (ratio .545 to the total length); hind leg long (ratio .86 to snout-vent

measurement); femoral pores few (10); enlarged supraoculars distinctly separated from frontals by a row of small granules; upper labial border flared; dorsal scales small, flat, larger than lateral granules; series of enlarged lateral granules from axilla to groin separated from ventrals only by one or two rows of smaller scales; ventral scales from gular fold to anus 75; none of the scales on body strongly keeled or mucronate; lateral abdominal blotches two, very small, elongate, distinct, not surrounded by blue.

*Description of type.* Head rather flattened, outline (viewed from sides) a smooth, even curve from occipital region to snout; scales of frontal, frontoparietal and anterior regions of head subequal in size, smooth, not conspicuously elevated; each scale anterior to frontal with a single posterior pit; median sector of nasal scales divided into three; two scales between nasals; two canthals; six superciliaries; enlarged supraoculars about 15-17 in number, not greatly enlarged nor in distinct rows; a row of granular scales about inner margin of orbit, separating supraoculars from frontals; five keeled suboculars, the median very long, the others much shorter; labial region flared, almost flat; six strongly imbricate and keeled upper labials; width of rostral about equal to distance between outer edges of nares; median third of rostral more or less triangular in shape, its base, as it were, elongated on either side and mostly overlapped by the first labial on either side; lower labials eight or nine to below middle of eye, gradually increasing in size posteriorly to a point below the middle of eye; symphyseal very small, smaller than first lower labial on either side, squarish, followed by a small median triangular scale; anteriorly in lateral gular region a single row of large scales, larger than and in contact with anterior lower labials; these scales decreasing in size posteriorly, and increasing in numbers to about three rows; posterior temporals large, the largest about equal in size to the posterior labials; anterior temporals somewhat smaller; gular scales smaller toward median ventral line; two gular folds, the anterior fold shallow and bordered anteriorly by the small gular scales, which grade into the granular scales which form the fold; posterior gular fold bordered anteriorly by scales as large as the ventrals on body, continuing on either side, slightly anterior to the insertion of the forearm, and terminating low on the shoulder; scales above and behind insertion of foreleg very small, granular, smaller than laterals; scales of trunk gradually increasing in size toward the median dorsal line; scales here about twice size of laterals; laterals in groin, above and behind in-

section of hind leg granular; a series of enlarged lateral granules from a point just behind axilla to near groin, narrowly separated from ventrals by two rows of small granules; all scales on body smooth and not mucronate; scales on anterior surface of femur about size of ventrals on abdomen, smooth, decreasing slightly in size toward femoral pores; scales on posterior and dorsal surfaces of femur about equal in size to lateral abdominals, also smooth; dorsals of tibia slightly larger than dorsals on body, smooth; ventrals on tibia somewhat larger than anterior femorals, some on the anterior lateroventral surface weakly keeled; dorsals on foot smooth, ventrals keeled; all scales on forearm smooth except those on ventral surface of hand.

Color above grayish, with a series of about nine very indistinct darker spots, emarginate behind, on each side of median dorsal line to base of tail; tail with about seven narrow transverse darker bands, interrupted medially on base of tail; limbs with very dim bands; numerous light flecks on body and base of tail, a few dark spots on neck; gular region and breast suffused with blackish; abdomen and posterior parts whitish; two small, narrow, diagonal black bars on each side of abdomen.

Snout to vent, 50 mm.; tail, 59 mm. (ratio, tail to total length, .545); hind leg, 43 mm. (ratio, hind leg to snout-vent measurement, .86); foot, 20 mm.; femoral pores, 10-10; ventrals from gular fold to anus, 75.

*Relationships.* The species is probably most closely related to *H. propinqua*, but differs from this species markedly by the possession of larger dorsals, smooth and rounded scales on the body and limbs, a smaller number of femoral pores, and the almost complete fusion of the lateral row of enlarged granules with the ventrals. In *H. propinqua* the lateral row of enlarged granules is very distinct and separated from the ventrals by six or seven rows of small granules. It differs from *H. maculata* and its subspecies by the possession of smooth, flat scales on the body, a much longer tail and longer hind legs; from *H. elegans* and *H. pulchra* it differs in the presence of very small scales between the frontals and enlarged supraoculars, almost complete absence of keels on the scales of the limbs, more strongly flaring labial and rostral regions, and longer hind legs; from *H. dickersonae* it differs in the absence of blue about the lateral dark spots, much more strongly imbricated upper labials, the strong flaring of the labial and rostral regions, the larger scales on the edge of the gular fold, and the longer tail.

*Remarks.* The propinqua group of *Holbrookia* is known from central Texas (*propinqua*) and in Arizona and the northwestern coastal region of Mexico (*pulchra* and *elegans*). *Holbrookia bunker*i, which belongs to this group, occupies a more or less median area in the great hiatus which exists between the respective ranges of the eastern and western species.

Schmidt (1922, p. 714) mentions a specimen from Chihuahua in the U. S. National Museum (No. 58446), remarking that it "may be a juvenile *propinqua*." It is possible that this specimen belongs to the species described here.

A number of eggs are present within the abdomen of the type. The region in which it was collected is low, rather barren, and very sandy. A short distance south of the locality where this specimen was taken there are large numbers of wandering and stationary sand dunes. It is likely that *H. bunker*i may be more common in this habitat than it was in the adjacent areas.

The species is named for Mr. C. D. Bunker, curator in charge of the Museum of Birds and Mammals of the University of Kansas, who made possible our trip by the loan of complete equipment. I am also indebted to him for the loan of comparative material used in this and other studies of Mexican and United States reptiles and amphibians.

*Holbrookia dickersonae* Schmidt

Fourteen specimens are in the collections, from the following localities: Durango: Near Avileo, August 25, 1932 (EHT and HMS No. 4384); 5 miles north of Conejos, June 25-26, 1934 (DHD and HMS Nos. 296-297, 318-319); 25 miles north of Bermejillo, June 27, 1934 (DHD and HMS Nos. 328-334, 344). Coahuila: 10 miles east of Torreón, August 20, 1932 (EHT and HMS No. 4384).

The bluish area on the sides of the belly is apparently very constant in the males. The smallest specimen (41 mm., snout to vent) shows more bluish in these patches than any of the males of *H. maculata approximans* in the collections. The dark blotches within the lateral blue area are more frequently two than three; in only one specimen (male) are there three distinct blotches. In two males there is a faint indication of the third (posterior) blotch; in all females there are but two.

Variations in proportions are shown in the following table.

Measurements and scale counts of *Holbrookia dickersonae*

|                        |       |       |       |       |       |       |       |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| I Number               | 4385  | 296   | 333   | 331   | 318   | 319   | 4384  |
| II Sex                 | ♂     | ♀     | ♀     | ♀     | ♀     | ♀     | ♀     |
| III Snout to vent      | 41.0  | 46.0  | 50.0  | 52.0  | 52.0  | 52.5  | 56.0  |
| IV Tail                |       | 44.0  | 49.0  | 50.0  |       | 48.0  | 48.0  |
| V Total length         |       | 90.0  | 99.0  | 102.0 |       | 100.5 | 104.0 |
| VI Ratio, IV to V      |       | .48   | .49   | .49   |       | .47   | .46   |
| VII Hind leg           | 33.0  | 41.0  | 42.0  | 44.0  | 46.0  | 43.0  | 40.5  |
| VIII Ratio, VII to III | .80   | .89   | .84   | .84   | .88   | .81   | .72   |
| IX Ventrals            | 69    | 66    | 82    | 64    | 74    | 67    | 64    |
| X Femoral pores        | 10-10 | 12-13 | 11-12 | 11-12 | 10-11 | 11-12 | 8-9   |

Measurements and Scale Counts of *Holbrookia dickersonae*—Concluded.

|                        |       |       |       |       |       |       |       |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| I Number               | 330   | 297   | 329   | 328   | 344   | 332   | 334   |
| II Sex                 | ♂     | ♂     | ♀     | ♂     | ♂     | ♂     | ♂     |
| III Snout to vent      | 57.0  | 57.0  | 59.0  | 59.5  | 60.0  | 63.5  | 64.0  |
| IV Tail                | 66.0  |       | 47.0  | 65.0  | 66.0  | 69.0  | 67.0  |
| V Total length         | 123.0 |       | 106.0 | 124.5 | 126.0 | 132.5 | 131.0 |
| VI Ratio, IV to V      | .53   |       | .44   | .52   | .52   | .52   | .51   |
| VII Hind leg           | 43.0  | 50.5  | 42.0  | 49.0  | 48.0  | 51.0  | 50.0  |
| VIII Ratio, VII to III | .75   | .88   | .71   | .82   | .80   | .80   | .78   |
| IX Ventrals            | 72    | 76    | 67    | 74    | 72    | 75    | 70    |
| X Femoral pores        | 10-10 | 11-12 | 12-12 | 11-12 | 12-13 | 10-11 | 11-11 |

The specimens from Durango were found in open, barren areas, where the lizards could be seen running about at considerable distances. They were extremely wary, running before it was possible to get within rifle shot, unless approached cautiously. The specimen from Coahuila was caught by hand amongst leaves along the side of the road in heavy brush. Five of the six females collected during June contained eggs; there were nine in one specimen (No. 329).

The species has before been reported only from southern Coahuila (Castanuelas and Alamos de Parras; Schmidt, 1922).

*Holbrookia maculata approximans* (Baird)

Four specimens were collected in 1934 by David H. Dunkle and myself: No. 95, 35 miles south of Moctezuma, Chihuahua, June 20;

Nos. 125-126, 40 miles south of Moctezuma, Chihuahua, June 21; No. 727, La Colorada, Zacatecas, July 8.

The specimen from La Colorada has longer hind legs, more femoral pores and a greater number of ventrals from gular fold to anus than usual, and in these respects approaches *H. dickersonae*. The tail, however, is shorter than in males of the latter species, and the black bars on the sides of the abdomen are not enclosed by blue.

Measurements and scale counts of *Holbrookia maculata approximans*

| I Number.....               | 727   | 126   | 125   | 95   |
|-----------------------------|-------|-------|-------|------|
| II Sex.....                 | ♂     | ♂     | ♂     | ♀    |
| III Snout to vent.....      | 51.0  | 55.0  | 56.0  | 57.0 |
| IV Tail.....                | 42.0  | 53.0  | 50.0  | 39.0 |
| V Total length.....         | 93.0  | 108.0 | 106.0 | 96.0 |
| VI Ratio, IV to V.....      | .45   | .49   | .47   | .40  |
| VII Hind leg.....           | 41.0  | 41.0  | 43.5  | 34.5 |
| VIII Ratio, VII to III..... | .80   | .74   | .77   | .75  |
| IX Ventrals.....            | 81    | 75    | 66    | 69   |
| X Femoral pores.....        | 13-15 | 11-11 | 9-11  | ?    |

Schmidt (1922) records this form from San Luis Potosí (Jesús María), Zacatecas (Berriozábal), Chihuahua (between Ojos del Diabie and Rio Santa María), Guanajuato and Durango. The records given by Cope (1887) of *H. maculata* from Guanajuato and Chihuahua are probably of this subspecies; likewise those of Garman (1887) of *H. maculata* from San Luis Potosí and Concordia (Coahuila); and that of Dugès (1896) of *H. approximans* from San Felipe (Guanajuato). Other records are from dubious localities.

*Holbrookia texana* (Troschel)

Thirty-seven specimens are in the collections, from the following localities: Nuevo León: Near Vallecillo, June 8, 1932 (EHT and HMS No. 269); spring near Sabinas Hidalgo, June 8, 1932 (EHT and HMS Nos. 323-324); 31 miles south of Sabinas Hidalgo, Sept. 1, 1932 (EHT and HMS No. 4622). San Luis Potosí: 30 miles north of Matehuala, August 20, 1932 (EHT and HMS Nos. 4057-4058). Coahuila: 4 miles west of Saltillo, August 23, 1932 (EHT and HMS Nos. 4280-4287); 2-3 miles north of Gomes Fariás, August 21, 1932 (EHT and HMS No. 4128); 32 miles west of San



Pedro, August 25, 1932 (EHT and HMS Nos. 4309-4313);  $1\frac{1}{2}$  miles west of Saltillo, August 24, 1932 (EHT and HMS Nos. 4423-4427, 4429-4437); near deserted village 30 miles west of La Rosa, August 30, 1932 (EHT and HMS Nos. 4522-4523). Durango: 6 miles northeast of Pedriceña, August 27, 1932 (EHT and HMS No. 4377); 7 miles south of La Loma, August 25, 1932 (EHT and HMS No. 4387); near Pasaje, August 28, 1932 (EHT and HMS No. 4441). Chihuahua: 15 miles south of Moctezuma, June 20, 1934 (DHD and HMS No. 120); Rio San Pedro, between Chihuahua City and Naica, June 22, 1934 (DHD and HMS Nos. 183-186); 18 miles north of Escalon, June 25, 1934 (DHD and HMS Nos. 257-260).

*Holbrookia texana* has been reported previously from the states of Chihuahua (Cope, 1887, 1900; McLain, 1899; Gadow, 1905), Coahuila (Yarrow, 1883; Garman, 1887; Cope, 1900; Günther, 1890), Nuevo León (Yarrow, 1883; Cope, 1900; Gadow, 1905; Günther, 1890), Durango (Gadow, 1905) and Sonora (Baird, 1859; Günther, 1890; Van Denburgh, 1922).

*Holbrookia elegans elegans* Bocourt

(Plate XXVII, fig. 2; Plate XXVIII, fig. 5)

Six specimens were secured by Dr. Edward H. Taylor near Presidio de Mazatlán, Sinaloa, Mexico, on July 22, 1934. They were found in a small sandy area in a bend of Rio Mazatlán not far from its mouth. They were extremely wary, running at the first sight of danger, and, unlike *H. elegans thermophila* and other species of *Holbrookia*, would not stop at a point of vantage to look about in their peculiarly curious manner, but would run directly to cover—under the sand at the bases of the occasional small shrubs which occurred there, or under piles of brush.

On the same trip Taylor secured a large series of *Holbrookia elegans thermophila* (Barbour) from Sonora. These specimens possess a certain few characters which distinguish them readily from the specimens taken at Mazatlán. The differences between these two forms—*H. elegans elegans* and *H. elegans thermophila*—are not great, yet sufficiently recognizable and constant that the two populations should be nomenclatorially recognized.

The specimens from Presidio (topotypes) possess tails shorter than the body in females (.49 to .493 of the total length). The single male has a regenerated tail. In all the females from Sonora, the tails are longer than the body (.507 to .574 in 16 specimens;

only one below .520; in the males the ratio of the tail to the total length varies from .528 to .601.)

The femoral pores of the specimens from Presidio are much larger than in those from Sonora. The pores of the single male of *H. elegans elegans* are about two-thirds as great in diameter as the scales are long; in large males from Sonora the diameter of the pores is not over half the length of the pore scales. In all the females of *H. elegans elegans* the pores are of about the same size as in the males of *H. elegans thermophila* of approximately the same snout-vent measurement, their diameter about one-half the length of the pore scales. On the other hand, even the largest females of *H. elegans thermophila* do not have pores whose diameter is over a fourth of the length of the pore scales.

This very great difference in size of the femoral pores, especially in females, cannot be a difference due to variation in sexual activity, for females of both were collected with eggs in about the same state of development.

Aside from these important structural differences, there are also differences in coloration. Of 35 females of *H. elegans thermophila*, only six show any evidence of the presence of a pink spot in the median posterior part of the gular region; all females (five) of *H. elegans elegans* possess the pink spot. It is present also in the single male of *H. elegans elegans*, but absent in all 33 of the males of the other subspecies. Allen (1933, p. 9) gives the extremes of variation in this character in specimens from Hermosillo; that of the females (34) is 0.52 to 0.66, and of the males (23), 0.55 to 0.60.

The dorsal rows of spots in females of *H. elegans elegans* are much more regular than in *H. elegans thermophila*. It is quite difficult to describe accurately the difference, which, once observed, can be seen to be quite distinctive. The spots in the southern form are more strongly angular, more regularly quadrilateral, and more definitely outlined by dark brown and white than in females of the northern form. In the latter they are usually more U- or V-shaped than quadrilateral, and the broad anterior border of each is only rarely definitely outlined.

There is no apparent difference in the dorsal coloration of the males. As in the larger males of *H. elegans thermophila*, so in the male of *H. elegans elegans* the dorsal spots are broken and obscured by the development over the whole body of numerous small, round, light spots. There is, however, a difference in the lateral black spots. In the male of the southern form the transverse diameter



of the spots is over twice the longitudinal diameter (including the part above the lateral fold, about three times), and there is but very little blue surrounding them. In all but one male of *H. e. thermophila* of approximately the same size, the blue completely surrounds the black spots and extends anteriorly and posteriorly from them a distance of from two to four or five millimeters. In these the black spots are only about one-third broader than long, and are more oval than quadrilateral in shape. In younger males the blue is more restricted, in a few cases approaching the condition found in the larger males of *H. elegans elegans*; the black spots are also somewhat broader, but in only three specimens do they approach the shape and proportions of those in *H. elegans elegans*.

A difference in the habits and habitat preferences of the two forms was noted by Doctor Taylor. *H. e. thermophila* was found only in flat, gravelly areas, but never in hills nor in sandy regions, although both of the latter types of habitat were carefully examined. Moreover, the lizards were not very wary, running when one approached too closely, but not to cover. They would run a short distance, and then stop to look around, much as *texana* also does.

*H. elegans elegans*, on the other hand, was found only in the place mentioned above, and was very abundant but very difficult to collect. It may be inferred that they would be found on the sandy beaches near Mazatlán, in a type of habitat which *thermophila* does not occupy at Guaymas; at least, it was not found by Taylor, who collected extensively on the beaches.

The published records of *H. elegans* which may be considered, on the basis of geographical probability, to be of *H. elegans elegans*, are all from Sinaloa, as follows: Mazatlán (Cope, 1868 [*Holbrookia bischoffi*, *nomen nudum*, *fide* Cope, 1887]; Bocourt, 1874; Cope,

Measurements and scale counts of *Holbrookia elegans elegans*

| I Number.....                      | 643   | 647   | 644   | 646   | 648   | 645   |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| II Sex.....                        | ♀     | ♀     | ♀     | ♀     | ♀     | ♂     |
| III Snout to vent.....             | 54.0  | 55.0  | 57.0  | 61.0  | 62.0  | 70.0  |
| IV Tail.....                       | 51.5  | 54.5  | ..... | 57.0  | 61.0  | ..... |
| V Total length.....                | 105.5 | 109.5 | ..... | 118.0 | 123.0 | ..... |
| VI Foreleg.....                    | 24.2  | 25.9  | 25.5  | 26.3  | 28.0  | 32.3  |
| VII Hind leg.....                  | 39.0  | 41.5  | 41.0  | 44.0  | 45.0  | ..... |
| VIII Femoral pores.....            | 14-16 | 14-14 | 14-15 | 13-14 | 13-14 | 14-?  |
| IX Scales, gular fold to anus..... | 66    | 66    | 70    | 62    | 68    | 67    |
| X Ratio, IV to V.....              | .488  | .493  | ..... | .479  | .495  | ..... |

1887; Boulenger, 1885; Dugès, 1896; Schmidt, 1922); Rosario and Escuiñapa (Schmidt, 1922). The latter author records *elegans* also from Bacubirito, Sinaloa, but since this locality is possibly within the range of *H. elegans thermophila*, it is problematical to which subspecies the specimens belong. Cope (1887) and Dugès (1896) report the species from Chihuahua, but the records are undoubtedly incorrect; it is quite possible that the specimens which they reported belong to the species *H. dickersonae*.

*Holbrookia elegans thermophila* (Barbour)

(Plate XXVII, fig. 1; Plate XXVIII, fig. 4)

Sixty-eight specimens of this form were secured by Doctor Taylor during the summer of 1934, in the following localities of the state of Sonora: 53 miles south of Nogales (EHT Nos. 58-59, June 19; 64, June 20); 8 miles south of Magdalena (EHT Nos. 75-77, June 20); near Noria (EHT Nos. 87, 88, 89, 89a, 90, June 21, 22); 30 miles south of Noria (EHT No. 111, June 22); 5 miles southwest of Hermosillo (EHT Nos. 128, 137, June 23; 170, June 22); 54 miles south of Hermosillo (EHT Nos. 192-196, June 26); 10 miles northwest of Guaymas (EHT Nos. 209, 209a, 210, 210a, 211, 211a, June 28; 226-229, June 29; 240-250, June 30; 282, 288, 289, July 1; 299, July 2; 323, July 3; 342-345, 349-353, July 4; 398, July 6; 406, July 7; 409-412, July 8; 467-472, July 12; 1135-1136, 1119a, 1119b, 1119c, 1119d, August 4).

Comparisons of this subspecies with *H. elegans elegans* have been given in the discussion of the latter.

A female from Noria (No. 90) has a very peculiar color pattern. Each of the brown dorsal blotches are completely surrounded by round, light areas which are strongly contrasted against a darker background of blackish suffusion. The proximal portion of the tail (the remainder lost) and the sides of the body are similarly marked, but less distinctly. There are no marked differences in scalation or proportions.

In one male (No. 64) there are three lateral black oblique bars on each side of the body. Two on each side occur in the other males of the series (32).

*H. elegans thermophila* has been reported in Sonora from Guaymas (Barbour, 1921; Schmidt, 1922; Allen, 1932), San Jose de Guaymas (Barbour, 1921), Batamotal (Schmidt, 1922), Hermosillo, Puerto and Llano (Allen, 1932). Schmidt (1922) mentions specimens from Bacubirito, Sinaloa; it is possible that these are *H. elegans elegans*.

Measurements and scale counts of *Holbrookia elegans thermophila*

## FEMALES

| I Number            | 249   | 228   | 409   | 245   | 76    | 170   | 410   | 210   | 58    | 211   | 344   | 470   | 226   | 250   | 343   |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| II Snout to vent    | 51.0  | 52.0  | 53.0  | 53.0  | 53.0  | 53.0  | 53.5  | 54.0  | 54.0  | 54.0  | 56.0  | 58.0  | 60.0  | 62.5  | 63.0  |
| III Tail            | 63.5  | 66.0  | 67.5  | 66.0  | 59.5  | 62.0  | 64.0  | 73.0  | 60.0  | 65.0  | 73.0  | 70.0  | 66.0  | 80.0  | 65.0  |
| IV Total length     | 114.5 | 118.0 | 120.5 | 119.0 | 112.5 | 115.0 | 117.5 | 127.0 | 114.0 | 119.0 | 129.0 | 128.0 | 126.0 | 142.5 | 128.5 |
| V Foreleg           | 25.0  | 25.2  | 24.2  | 25.3  | 25.5  | 23.2  | 23.0  | ..... | 25.4  | 25.0  | 24.5  | 26.0  | 25.0  | 27.5  | 28.0  |
| VI Hind leg         | 43.5  | 44.0  | 39.5  | 45.0  | 42.5  | 38.0  | 42.0  | 45.5  | 40.3  | 43.5  | 48.5  | 47.0  | 45.0  | 48.0  | 45.0  |
| VII Femoral pores   | 12-12 | 14-15 | 12-14 | 12-13 | 11-11 | 13-14 | 13-15 | 14-16 | 11-12 | 13-13 | 13-14 | 13-15 | 14-?  | 13-14 | 11-13 |
| VIII Ventrals       | 72    | 67    | 68    | 74    | 69    | 64    | 70    | 67    | 65    | 73    | 80    | 71    | 74    | 67    | 75    |
| IX Ratio, III to IV | .554  | .559  | .560  | .554  | .528  | .539  | .544  | .574  | .526  | .546  | .558  | .546  | .523  | .561  | .507  |

## MALES

| I Number            | 54    | 243   | 240   | 210   | 342   | 128   | 137   | 77    | 87    | 246   | 289   | 467   | 211   | 209   | 1119c |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| II Snout to vent    | 57.0  | 58.0  | 59.0  | 60.0  | 60.5  | 61.0  | 62.0  | 62.5  | 62.5  | 64.0  | 65.0  | 68.0  | 71.0  | 72.0  | 75.0  |
| III Tail            | 73.0  | 66.0  | 89.0  | ..... | 81.0  | 77.0  | 76.5  | 70.0  | 80.0  | 88.0  | 77.0  | 92.0  | 91.0  | 106.0 | 93.5  |
| IV Total length     | 130.0 | 124.0 | 148.0 | ..... | 141.5 | 138.0 | 138.5 | 132.5 | 152.5 | 152.0 | 142.0 | 160.0 | 162.0 | 178.0 | 168.6 |
| V Foreleg           | 29.5  | 26.0  | 29.1  | 27.5  | 28.0  | 27.0  | 29.5  | 26.0  | 28.3  | 30.0  | 31.0  | 31.0  | 34.0  | 33.0  | 34.0  |
| VI Hind leg         | 49.0  | 44.0  | 49.0  | 50.0  | 51.0  | 45.2  | 49.0  | 47.5  | 44.0  | 51.5  | 51.0  | 55.0  | 56.0  | 58.0  | 60.0  |
| VII Femoral pores   | 11-12 | 13-?  | 14-15 | 16-16 | 15-15 | 10-11 | 14-14 | 12-12 | 13-?  | 12-13 | 12-13 | 13-14 | 10-10 | 12-14 | 13-15 |
| VIII Ventrals       | 71    | 69    | 75    | 79    | 68    | 63    | 71    | 77    | 75    | 69    | 80    | 72    | 73    | 73    | 76    |
| IX Ratio, III to IV | .554  | .532  | .601  | ..... | .572  | .557  | .552  | .528  | .590  | .578  | .542  | .571  | .561  | .505  | .554  |

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## PLATE XXVII

FIG. 1. *Holbrookia elegans thermophila*. EHT No. 410, female, snout to vent measurement 54.5 mm.

FIG. 2. *Holbrookia elegans elegans*. EHT No. 648, female, snout to vent measurement 62 mm.



PLATE XXVII



## PLATE XXVIII

FIG. 3. *Holbrookia bunkeri*. Type, female, snout to vent measurement 50 mm.

FIG. 4. *Holbrookia elegans thermophila*. Same as in fig. 2. Ventral sacral region.

FIG. 5. *Holbrookia elegans elegans*. Same as in fig. 1. Ventral sacral region.

PLATE XXVIII

